

A NEW SPECIES OF *METAPOLYBIA* DUCKE FROM CENTRAL AMERICA (HYMENOPTERA: VESPIDAE; POLISTINAE)

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Abstract.—A new species of the paper wasp genus *Metapolybia* Ducke is described, and its similarities to other species of the genus are discussed.

Metapolybia Ducke is a small genus of neotropical paper wasps in the tribe Epiponini of the subfamily Polistinae. The tribe is of interest for its behavior of founding colonies by swarms of multiple queens accompanied by workers, and the genus is of interest because the phenomenon of cyclical oligogyny. West-Eberhard (1978), studying *Metapolybia aztecoides* Richards, observed that, although the swarm initiating a colony began with multiple egg-layers, only one egg-layer remained by the time that reproductive progeny were produced. This type of colony cycle, termed cyclical oligogyny by Strassmann et al. (1991), is considered to be important in the maintenance of eusociality in swarm-founding wasps, by raising relatedness among queens.

Metapolybia was described as a genus by Ducke (1905: 7, 10, 17) for *Polybia pediculata* de Saussure, 1854 (now considered a synonym of *cingulata* (Fabricius, 1804)). Ducke (1905: 17) also stated that *Polybia suffusa* Fox, 1898, must belong to the genus, but in his revision of 1910 treated the genus as monotypic, with several color varieties. A subsequent revision by Araujo (1945) recognized five species; the most recent revision (Richards, 1978) recognized 11 species.

The presently described species has not been properly recognized as a distinct taxon. It has been the subject of behavioral study by Drs. Istvan Karsai and John Wenzel of Ohio State University, and we are describing the species in order that the name be available for publication of their work.

Metapolybia mesoamerica, new species

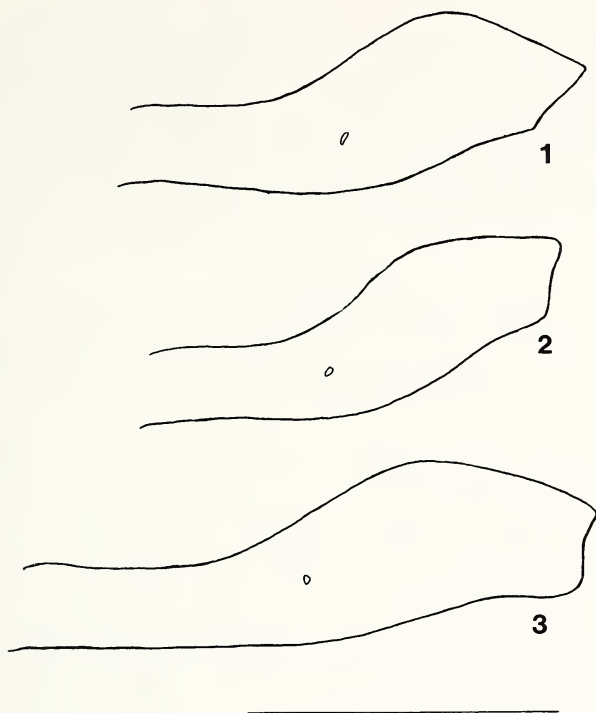
(Figs. 3, 5)

Diagnosis

Pronotum with humeri gently rounded, not projecting. Anterior pronotal carina distinct, obtuse, effaced ventrally. Pretegular carina smoothly curved, not interrupted anteriorly. Mesepisternal punctures moderately abundant, shallow. Propodeal hairs relatively abundant, long and erect. Propodeal sculpture weakly striate. First metasomal tergum posterior to spiracle gently but distinctly convex. Medium-sized species; color brownish, reddish and yellow.

Description

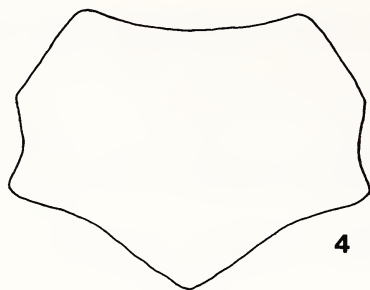
Female: Forewing length 7.9 mm. *Structure*—cuticle finely reticulate, moderately punctured on head and mesosoma, shallower punctures on metasoma; clypeus slight-



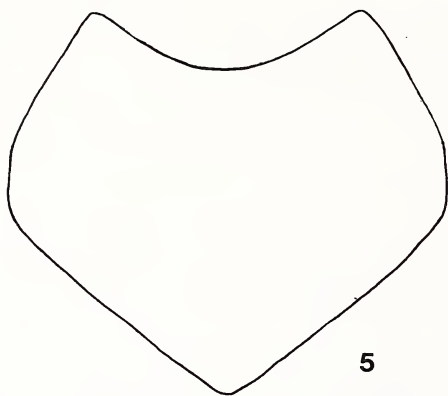
Figs. 1–3. First metasomal segment in lateral view. 1. *Metapolybia docilis*. 2. *M. suffusa*. 3. *M. mesoamerica*. The scale bar is 2 mm.

ly wider than high (Fig. 5); ventral margin of eye rounded, not subangulate; inter-antennal prominence very weak with weak median furrow, slightly convex when viewed from above; posterior ocelli separated by a distance slightly more than their diameter; gena narrows abruptly to vertex from top quarter of eye; anterior margin of pronotum with well developed transparent lamella dorsally, lamella not projecting ventro-laterally; anterior pronotal carina raised laterally, obtuse, effaced dorsally and ventrally; humeri very gently rounded and scarcely projecting in front of tegula; pretegular carina raised, projecting anteriorly, forming uninterrupted curve; scutellum convex, with complete medial line, distinctly raised anteriorly, becoming lower posteriorly; propodeum with median furrow not developed dorsally, only weakly developed ventrally, very weakly striate; first metasomal tergum with spiracles sharply projecting, moderately convex after the spiracles (Fig. 3); metasoma with sparse, shallow punctures posteriorly on terga III–VI.

Color—ground color reddish brown to dark brown; head, brown to black: margin of mandibular teeth, ventral margin of mandible, mandibular condyle, and ventral margin of clypeus, yellow; clypeus with orange tinge above; antennae with scape and pedicel testaceous brown, flagellum dark brown, scape yellow beneath; abundant yellow to orange markings, including between epistomal suture and lower third of eye, spot ventrally on gena, anterior pronotal carina with stripe extending ventrally



4



5

Figs. 4-5. Clypeus in frontal view. 4. *Metapolybia suffusa*. 5. *M. mesoamerica*. The scale bar is 1 mm.

the same width as carina, posterior dorsal margin of pronotum, margins of propleuron weakly, stripe extending along scrobal forrow, most of tegula, tinge on ventral margin of mesepisternum, most of scutellum (orange), the axilla, laterally bifid mark anteriorly on metanotum, spot on upper margin of metapleuron, spots ventrally on propodeum, forecoxae anteriorly, spots on meso- and metacoxae, posterior margins of first tergum posterior bands on terga II-V, posterior bands on sterna II-V, weak on V; wings hyaline with brown venation.

Vestiture—body covered with appressed pubescence and more scattered short outstanding bristles anteriorly on propleura, ventrally on mesepisternum, anteriorly on coxae, postero-laterally on terga, sterna; longer hairs on lower margin of clypeus, conspicuous on propodeum (up to twice an ocellar diameter long) and posterior metasomal segments.

Variation—The color pattern described above varies primarily in the ground color, from dark brown in Costa Rica and Mexico to reddish in Panamá. Specifically, the Panamanian specimens are reddish to testaceous brown laterally on the mesosoma, scutellum, and metasoma. The Panamanian specimens have a stronger medial line on the metanotum and stronger yellow band on tergum V, and the pale markings tend toward orange; the Costa Rican specimens have yellow markings. The Costa Rican specimens are somewhat larger with mean forewing length of 8.2 mm, compared to 7.8 mm in the Panamanian specimens.

Male: unknown.

Nest: astelocytarus; envelope and comb composed of brittle, brownish paper, envelope with extremely numerous “windows” of clear salivary secretion, with “eaves” extending laterally (Nest 901212-1, taken on the side of a building).

Distribution: Costa Rica. Limón, La Selva; Panamá: Panamá, Bocas del Toro; Mexico: Vera Cruz.

Type material: holotype female COSTA RICA: Rio Danta, 4 km W Guápiles, 9 December 1990, Carpenter & Wenzel, Nest 901209-2. Paratypes: MEXICO: Vera Cruz, Cordoba, 2319, 1 female [determined as *Metapolybia suffusa* by Richards]; COSTA RICA: Puntarenas, Golfito, 30 July 1957, Truxal & Menke, 3 females; Prov. Limón, Amubri, 30 Jan. 1979, C. K. Starr, Nest series no. 93, 2 females; Finca La Selva Research Station, 3–14 March 1986, D. Bowers, 1 female; Rio Danta, 4 km W Guápiles, 9 December 1990, Carpenter & Wenzel, Nest 901209-2, 10 females, + 268 females preserved in ethanol; PANAMÁ: Boc. Toro, Changuinola Dist., April 1924, J. C. Bradley, 1 female; Canal Area, Barro Colorado Isl., 12 December 1990, Carpenter & Wenzel, Nest 901212-1, 11 females, + 90 females preserved in ethanol; Barro Colorado Island, 1 November 1995, Karsai and Wenzel, 4 females.

Holotype in the American Museum of Natural History. Paratypes in the American Museum of Natural History, U.S. National Museum of Natural History, Ohio State University, Universidad de Costa Rica and Smithsonian Tropical Research Institute.

Etymology: The specific name is a reference to the geographic range of the species, in Central America, and is to be treated as a noun in apposition.

COMPARATIVE REMARKS

Metapolybia mesoamerica has a number of similarities to *M. azteca* Araujo, *M. docilis* Richards and *M. suffusa*. One of the features shared with *M. azteca* and *M. suffusa* is the presence of numerous long, erect hairs on the propodeum. Richards (1978:183) used this as a primary character in separating the species of *Metapolybia* in his key. *Metapolybia azteca* and *M. suffusa* possess these hairs in a roughly equivalent density, with *M. suffusa* having hairs that are somewhat longer and more robust in the specimens we have seen. *Metapolybia mesoamerica* is similar to *M. suffusa*, with propodeal hairs that are both relatively abundant and long. *Metapolybia docilis* largely lacks these hairs, having only a few, scattered long hairs.

Another key character in this genus is the shape of the humeri on the pronotum. In this feature, *M. azteca* and *M. suffusa* are similar in that their humeri are subangulate but do not project. *Metapolybia docilis* has humeri that are gently rounded and project almost not at all. *Metapolybia mesoamerica* has humeri that differ in

shape from *M. azteca* and *M. suffusa* in that they are gently rounded, and do not project, like *M. docilis*.

Metapolybia azteca and *M. docilis* have a first metasomal tergum that is quite convex posterior to the spiracles (Fig. 1). *Metapolybia suffusa* differs in having the first tergum very little convex posterior to the spiracles (Fig. 2). *Metapolybia mesoamerica* has a distinctly though gently convex first tergum posterior to the spiracle (Fig. 3). In this its condition is intermediate between the convexity of *M. docilis* and *M. suffusa*.

Metapolybia azteca has a clypeus that is almost as high as wide, while in *M. suffusa* the clypeus is clearly wider than high (Fig. 4). *Metapolybia docilis* and *M. mesoamerica* have the clypeus slightly wider than high (Fig. 5).

Metapolybia azteca and *M. suffusa* lack striae on the propodeum lateral to the median furrow. *Metapolybia docilis* has quite distinct striae. *Metapolybia mesoamerica* bears weak striae on the propodeum lateral to the median furrow. Here again, *M. mesoamerica* has a condition intermediate between *M. docilis* and *M. suffusa*.

Species of *Metapolybia* also differ in the degree and depth of mesepisternal punctures. The mesepisternal punctures of *M. mesoamerica* are moderately abundant, like those of *M. azteca* and *M. docilis*. *Metapolybia suffusa* has somewhat less abundant punctures. *Metapolybia azteca* and *M. docilis* bear somewhat deeper punctures; *M. mesoamerica* is more similar to *M. suffusa* in having shallower mesepisternal punctures.

Metapolybia azteca and *M. suffusa* have a relatively acute anterior pronotal carina when compared to *M. mesoamerica*. The anterior pronotal carina of *M. docilis* is more obtuse and less distinct than that of *M. mesoamerica*. All four species of *Metapolybia* have the anterior pronotal carina becoming effaced ventrally. *Metapolybia azteca*, *M. suffusa* and *M. docilis* have the carina extending into the ventral angle of the pronotum. The ventral limit of the carina corresponds to a distinct projection of the anterior margin of the pronotum, which has the anterior lamella narrowed at the projection. There is no projection of the anterior pronotal carina in *M. mesoamerica*, and the anterior lamella is not narrowed, thus *M. mesoamerica* has a more smoothly curved anterior margin to the pronotum.

Finally, *M. azteca* and *M. docilis* have a less distinct pretegular carina than *M. suffusa*. *Metapolybia suffusa* also has a distinct anterior interruption in the pretegular carina at the spiracular lobe. *Metapolybia mesoamerica* has a distinct, anteriorly projecting pretegular carina with a smooth anterior curve.

The species-level phylogeny of *Metapolybia* has not been investigated. There has yet to be any kind of infrageneric classification. *Metapolybia mesoamerica* shares some features with each of the other three species discussed above, although it is not clear at this time which of these features constitute apomorphies within the genus. In the key of Richards (1978: 183-184), *M. mesoamerica* runs to the fourth couplet, where *M. azteca* and *M. suffusa* are keyed. These latter two species are separated by size, color and mesepisternal punctation. In size like *M. azteca*, in color more like *M. suffusa*, *M. mesoamerica* is intermediate in mesepisternal punctation. Other salient features (clypeal dimensions, the obtuse anterior pronotal carina, the pretegular carina, and propodeal sculpture and) clearly differentiate *M. mesoamerica* from these species. One of the most important features for differentiating among the *suffusa-mesoamerica-docilis* complex is the convexity of the first tergum posterior to

the spiracle. The intermediate condition of *M. mesoamerica* in this character, as in others, suggests that cladistic analysis is necessary to determine sister-group relationships of the species.

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